

LIST OF COMMENTERS FOR RESPONSE IN THE FINAL SURTASS LFA
DETERMINATION FEDERAL, REGISTER NOTICE

Group A- 1

1. Marine Mammal Commission, Robert H. Mattlin, Ph.D.
2. Natural Resources Defense Council
3. Stop LFAS Now Network, Cheryl Magi11
4. Dr. Lee Tepley
5. Mr. Lanny Sinkin



NATURAL RESOURCES DEFENSE COUNCIL

**By Certified Mail
Return Receipt Requested**

May 31, 2001

Ms. Donna Wieting, Chief
Marine Mammal Conservation Division
Office of Protected Resources
National Marine Fisheries Service
13 15 East-West Highway
Silver Spring, MD 20910-3226

Re: Proposed Rule for Taking of Marine Mammals Incidental to Navy
Operations of Surveillance Towed Array Sensor System Low Frequency
Active Sonar (SURTASS LFA)

Dear Ms. Wieting:

On behalf of the Natural Resources Defense Council ("NRDC") and its over 500,000 members nationwide, we submit these comments on the Proposed Rule, issued by the National Marine Fisheries Service last March (66 Fed. Reg. 15375 (Mar. 19, 2001)), on the U.S. Navy's Surveillance Towed Array Sensor System Low Frequency Active ("LFA") sonar program. These comments supplement those submitted by NRDC regarding the Navy's draft Environmental Impact Statement on November 18, 1999, incorporated herein by reference.'

Concurrent with transmittal of these comments, we have today submitted to the Navy a formal request for preparation of a Supplemental Environmental Impact Statement, based on significant new information about LFA's potential impacts on marine mammals. The mass mortality of cetaceans in the Bahamas last year, and the investigation and scientific analysis that have followed, indicate that the potential extent and the severity of injury that LFA could induce far exceeds that currently analyzed by the Navy (in its Final

¹ NRDC is aware that comments are being submitted independently by a substantial number of organizations and individuals from the scientific and environmental communities. The comments that follow do not constitute a waiver of any factual or legal issue raised by any of these organizations or individuals and not specifically discussed herein.

Environmental Impact Statement) and by NMFS (in its Proposed Rule).’ On this basis alone, we urge NMFS to withdraw its Proposed Rule.

This new information also serves to underscore many of the larger concerns of the comments below: that NMFS, following the Navy, has failed to assess many of the system’s potential impacts, including some of the most severe; that it has underestimated the impacts considered; and that-against the plain language and intent of the law-it would grant a “small take” permit to a program whose “takes” of marine mammals are in every sense global and in no sense “small.”

There is widespread concern, in the scientific as well as the environmental community, that the impact of “high intensity sonar and expansion of its use in the sea presents an unacceptable risk to marine species and their habitat.”³ For the reasons summarized below, we urge NMFS to withdraw the Proposed Rule and deny the Navy’s application.

I. BACKGROUND

During the early years of the Cold War, the Navy developed and deployed a worldwide ocean surveillance system known as SOSUS (“Sound Surveillance System”). Unlike LFA, the system was passive: built to receive signals, not to transmit them. Hydrophones fixed in critical locations around the globe would record the acoustic signatures of foreign submarines. As submarines grew quieter, with nuclear and electric engines replacing diesel, the Navy kept pace by devising newer and better algorithms for detection. Then, in the 1980s, the paradigm shifted. The Navy began investing its resources in an active, long-range sonar system, one that could detect the presence of deep-sea submarines by bombarding them with high-intensity, low frequency noise.⁴ According to military planners, the sonar was originally developed to meet a perceived Soviet threat. With the fall of the Soviet Union and the end of the Cold War, the need for the program was questioned by the non-partisan Government Accounting Office.’ But LFA, though scaled down, was not abandoned.

The active component of LFA is an array of eighteen loudspeakers lowered several hundred feet from a ship’s hull into the ocean. The speakers are synchronized through electrical lines running the length of a central cable; sounding in tandem, they converge a few hundred meters from the source, the exact distance varying with frequency, creating

² Department of the Navy, Final Overseas Environmental Impact Statement and Environmental Impact Statement for Surveillance Towed Array Sensor System Low Frequency Active (SURTASS LFA) Sonar (Jan. 2001) (hereinafter cited in the text as “FEIS”).

³ Statement of Concern (May 2001) (signed by over 40 marine scientists) is appended to the present document as Exhibit “A”.

⁴ This early history is summarized in Donald White, Low-Frequency, High-Power-Density, Active Sonars, Sea Technology, May 1995, at 54 and in the Navy’s FEIS at 1-7 to 1-8.

⁵ See GAO, Report to the Acting Secretary of the Navy; Undersea Surveillance: Navy Continues to Build Ships Designed for Soviet Threat, GAOMSIAD-93-53 (1992).

zones of focalized sound in a fan pattern that extends many hundreds of miles from the source. FEIS at 2-2 to 2-4, 4.2-3 1 to 33. The low frequencies used by the system—the Navy states its operating range as between 100 Hz and 500 Hz (FEIS at 2-3)—combined with its powers of focalization allow it to scan for vessels at long ranges. The typical schedule defined in the FEIS would involve as many as four host ships, each typically deployed for nine months out of the year and each transmitting for as many as 432 hours on a 20% duty cycle. FEIS at 2-6 to 2-8.

The intensity of the sound field that LFA would produce has not been precisely divulged. Nowhere in the sound field, the Navy claims, will the received level rise above 215 dB, the sound pressure level of a single speaker in the array, measured from 1 meter's distance. This would seem to suggest that the source level of the array is 215 dB, and that to calculate the signal's level at a distance one would have only to subtract propagation loss from this number. Since, however, almost the entire LFA sound field consists of multiple 215 dB sources sounding in tandem with one another, it is necessary to know how well these sources converge. Beyond a few hundred meters from the source, where the vast majority of environmental impacts are expected to occur, the "effective" source level of the entire array is not 215 dB, but a level as high as 240.1 dB.⁶ Unfortunately, NMFS has not sought to clarify the Navy's misleading information or to ascertain for the public the precise effective source level of the array.'

It is evident, in any case, that sound generated by the system attenuates slowly beyond the 1 kilometer radius that the Navy has proposed to monitor for impacts. We know from an earlier environmental assessment that the system is capable of generating a source level of at least 230 dB, and the sound within its convergence zones was predicted to reach 140 dB over 300 nautical miles from the source.* A preliminary, independent analysis of some of the Navy's SOSUS data indicates that, during LFA tests off the coast of California, signals were clearly audible at sites across the entire North Pacific.'

Testing of LFA began several years before elements of the program were declassified and the public could learn of its existence. Between August 1988 and July 1994, LFA was

⁶ This number is based upon the standard equation for calculating the effective source level of non-point sources: $ESL = SL + 20 \log(N)$, where ESL = effective source level, SL = source level of an individual sound projector, and N = number of projectors. The equation is provided in an appendix to the Navy's FEIS, but a calculation for the LFA array is not provided.

⁷ The importance of acknowledging the "effective source level" in this case is emphasized in Letter from John Potter, Research Assoc. Professor, Assoc. Director of the Tropical Marine Science Institute, and Head of the Acoustic Research Laboratory, National University of Singapore, to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service (May 31, 2001) (attached to the present document as Exhibit "B").

⁸ See CNO, Environmental Assessment for Use of Surveillance Towed Array Sensor System Low Frequency Active in Connection with a Submarine Security and Technology Program Test [CNO Project K154-4] (July 1997). Please note that all decibel levels quoted in these comments refer to sound pressure calculated logarithmically to a reference unit of $1 \mu Pa$.

⁹ Letter from Dr. Mark McDonald, Whale Acoustics, to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service (Apr. 2001) (attached as Exhibit "C").

deployed in at least 22 separate operations, for which, to our knowledge, no Environmental Assessments were prepared.¹⁰ Eight additional trials took place after July 1994: one in the Hawaiian Islands, one across the Aleutian Islands of Alaska, one west of Vancouver (British Columbia), one in the Gulf of Oman and Persian Gulf, and at least three, perhaps four, off the California coast.” For none of these operations was a small take exemption obtained under the Marine Mammal Protection Act (“MMPA”), consultations performed as required by the Endangered Species Act, state agencies notified under the Coastal Zone Management Act, or obligations met under a variety of other environmental laws.¹² During roughly the same period that the Navy was conducting its exercises, NATO was testing an active sonar system with low-frequency components (known as TVDS) in the Mediterranean Sea. A mass stranding of Cuvier’s beaked whales in the Kyparissiakos Gulf, an inlet of the Mediterranean off the west coast of Greece, in May 1996, which was correlated and closely timed with one of the NATO tests, would later draw attention to the potential impacts of military active sonar.¹³

In 1996, after discussions with NRDC and with concern mounting over the effects of anthropogenic noise on marine life in general, the Navy agreed to prepare an environmental impact statement and to delay full deployment of LFA until its legal requirements were met. See 61 Fed. Reg. 37452-53 (July 18, 1996). To help resolve some of the uncertainties about the program’s impacts, particularly with regard to mysticetes, the great baleen whales, it decided to fund a three-phase Scientific Research Program (“SRP”), whose results, though limited, have been incorporated into the EIS. On August 12, 1999, the Navy submitted an application for a small take exemption to the moratorium established in the MMPA on the killing, hunting, and harassment of marine mammals. The present proceeding arises out of that application.

On March 15, 2000, after the application had been submitted to NMFS, 16 whales from at least four different species (3 species of beaked whale and 1 species of baleen whale) stranded alive on the coasts of Abaco, Grand Bahama, and North Eleuthera in the northern Bahamas. Individuals and small groups of animals had beached for many miles along the coast, suggesting that each stranded whale had been directly impacted by a single cause occurring over a wide area of ocean. Necropsies performed on four of the beached whales-unable to return to sea, 7 of the whales had died-showed bleeding in the ears and other anomalies that investigators have found consistent with auditory trauma. This, along with other data obtained in a subsequent investigation, provided

¹⁰ See SPAWAR, Request for Concurrence in Use of LFA Sound Source in Magellan 11, Ser. PNW 182/C225D (July 15, 1994).

¹¹ Compiled from Environmental Assessments prepared by the U.S. Navy. See, e.g., Chief of Naval Operations, Environmental Assessment for Use of Surveillance Towed Array Sensor System Low Frequency Active in Connection with a Submarine Security and Technology Program Test [CNO Project K 154-4] (July 1997). To our knowledge, the exact location of the Magellan II exercise (August 1994) remains classified.

¹² An incidental harassment authorization (16 U.S.C. §1371 (a)(5)(D)) was obtained only for the most recent test in the Aleutian Islands, while the Navy’s draft EIS was still in process.

¹³ See SACLANT Undersea Research Center, Summary Record, infra.

clear evidence that the strandings were caused by active sonar: a mid-frequency active sonar operated by a Navy battle group transiting the area.¹⁴

Last February, one month before NMFS' Proposed Rule was released, a research biologist with the Bahamas Marine Mammal Survey reported in a letter to the Navy that individuals from one species that had stranded, approximately 35 Cuvier's beaked whales that had been photo-identified as resident in the area, had not been spotted since the strandings." He postulated that, consistent with the necropsy data, the scientific literature on the physiological effects of intense sound, and other evidence, the causal mechanism of the strandings may have been resonance effects, a vibration of cavities within the body intense enough to cause shearing of tissue, hemorrhaging, and serious injury or death.¹⁶ That this is a serious possibility demanding NMFS' attention-and a complete reassessment of LFA-has been affirmed by a number of bioacousticians and marine researchers in their comments to NMFS, some of which are appended to the present letter.¹⁷

II. NMFS' COMPLIANCE WITH THE MARINE MAMMAL PROTECTION ACT

Enacted by Congress in 1972, the MMPA recognizes the "danger of depletion or extinction" that "man's [ocean] activities" pose and commits the federal government to a strict policy of species and habitat conservation. 16 U.S.C. § 1361. Congress' approach is precautionary. Rather than place the burden of proof on science and defer the regulation of human activity until its harms had been confirmed, the MMPA takes the prudent view that almost any disturbance of marine mammals is potentially damaging. "[I]t seems elementary common sense," the House Committee on Merchant Marine and Fisheries observed in sending the bill to the floor,

that legislation should be adopted to require that we act conservatively—that no steps should be taken regarding these animals that might prove to be adverse or even irreversible in their effects until more is known. As far as could be done, we have endeavored to build such a conservative bias into the [Marine Mammal Protection Act].

¹⁴ NMFS, NOAA Fisheries Status Report: Preliminary Findings on the Stranding of Beaked Whales in the Bahamas (June 14, 2000); NMFS, NOAA Fisheries Status Report; NMFS, NOAA Fisheries Status Report on the One Year Anniversary of the Stranding of Beaked Whales in the Bahamas (Mar. 26, 2001).

¹⁵ It should be noted that NMFS released its Proposed Rule before its own joint investigation (with the Navy) into the Bahamas strandings-regardless of its findings-had been completed. The final report has not been released as of this date, and neither NMFS nor the Navy has released any of the data they have obtained, despite calls in the environmental and scientific communities for an open and transparent process

¹⁶ See part II(B)(i), *infra*.

¹⁷ In addition to comments by scientists, we are attaching a record of public comments submitted through NRDC, including a large number that were not successfully transmitted to NMFS due to heavy facsimile traffic on this issue (Exhibit "D").

Congress thus intended to give no less than “optimum protection [to] the marine mammals affected by the bill.”¹⁸

The heart of the MMPA is its so-called “take” provision, a moratorium on the harassing, hunting, or killing of marine mammals. 16 U.S.C. § 1362(13). Any human activity that affects or attempts to affect marine mammals in these ways falls under the ban. Exemptions are available for specified activities, such as scientific research, photography, commercial fishing, and subsistence hunting by Native Americans, provided they meet certain categorical requirements.¹⁹ Activities that fall outside these categories may also receive an exemption: the MMPA sets forth two processes, each with its own standards and procedures, by which proponents may receive permission to “take” animals incidental to their business. A “small take” exemption, described at 16 U.S.C. § 1371 (a)(5)(A), has been requested in this case..

In approving such an exemption, the Secretary of Commerce has the burden of fulfilling two statutory responsibilities. First, he must make an affirmative finding that the activities proposed will have only a “negligible impact” on marine mammals. Id. NMFS defines “negligible impact” as one “that cannot reasonably be expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” 50 C.F.R. § 2 16.103. Projects whose impacts can reasonably be expected to harm marine mammals in this way are simply not qualified for an exemption, and the process ends there. Second, once the Secretary finds that the proposed activity is likely to have only a negligible effect on a species or stock, he is obliged to prescribe (1) “methods” and “means of effecting the *least practicable* impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance” and (2) “requirements pertaining to the monitoring and reporting of such taking.” 16 U.S.C. § 1371(a)(5)(A)(ii)(I), (III) (emphasis added).²⁰

Should the Secretary permit the taking of marine mammals in breach of either duty, he will have violated the MMPA. Unfortunately, that is exactly what the applicant in this case would have the Secretary do. For all their tortured argument, the documents submitted by the Navy simply fail to support an affirmative finding of “negligible impact.” What is more, they fail to set forth means of “effecting the least practicable adverse impact,” offering instead a pre-selected set of alternatives, a fait accompli. More generally, the global scale of operations of the extended range sonar system contemplated

¹⁸ Report of the House Committee on Merchant Marines and Fisheries, reprinted in 1972 U.S. Code Cong. & Admin. News 4 148.

¹⁹ See, e.g., 16 U.S.C. §§ 1371(a)(1) (exempting scientific research, public display, photography for educational or commercial purposes, and other activities), 1371(a)(4) (exempting commercial fishing), 1371 (b) (exempting subsistence hunting).

²⁰ The language chosen by Congress is strong. On the basis of this provision alone, the U.S. District Court for the Central District of California in granting NRDC a preliminary injunction against the Navy’s 1994 “ship-shock” tests in the Southern California Bight found it a “near-certain likelihood” that NMFS had violated the MMPA. Natural Resources Defense Council, Inc. v. United States Department of the Navy, 857 F. Supp. 734, 735 (C.D. Cal. 1994). This precedent is discussed at greater length below.

by the Navy belies any reasonable interpretation of "small take" and renders LFA, at least in its current form, legally ineligible for an exemption.

We therefore urge NMFS, as the agency charged with enforcing the MMPA, to reject the Navy's application as it stands, both because it fails to **qualify** as "small take" and **because** it cannot support a finding of "negligible impact"; and to insist, should the application ever be resubmitted, that the Department of Defense conduct a full, transparent, and objective analysis of mitigation protocols for LFA, in compliance with NMFS' duties under the law.

A. The Activities Proposed by the Navy Are Not Eligible for a "Small Take" Exemption.

In even requesting a "small take" exemption, the Navy has strained the language of the MMPA. The exemption that Congress wrote into law is not some universal loophole for circumventing the moratorium on take that Congress created. On the contrary, its focused language establishes a legal threshold of eligibility. To be eligible for an exemption, activities must (1) occur within "a specified geographic region" and (2) involve the incidental take of only "small numbers of a marine mammal species or population stock." 16 U.S.C. § 1371(a)(5)(A). These restrictions are a clear reflection of Congress' intent to "act conservatively" to avoid broad steps that "might prove to be adverse or even irreversible in their effects until more is known." H. Rpt No. 1488, 92nd Cong., 2d Sess. (1972), reprinted in 1972 U.S. Code Cong. & Admin. News 4148. In the case of the Navy's application for a permit, neither of these threshold requirements has been met.

(1) The scope of activity contemplated by the Navy exceeds any reasonable interpretation of "specified geographic area."

In its regulations, NMFS defines "specified geographic area" to mean "an area... that has certain biogeographic characteristics" (50 C.F.R. § 2.16.103), i.e., certain common features of species and habitat abundance and distribution.²¹ Activities for which rules were proposed in 1997, for example, were restricted in one case to waters offshore Norfolk, Virginia and Jacksonville, Florida, and in another to the Beaufort Sea off the north coast of Alaska—two areas of impact that at least arguably meet the statutory and regulatory definitions.²² Indeed, to our knowledge, NMFS has never issued a small take exemption, let alone proposed rules, for an activity that is so global in its scope, so global in its impact, and so

²¹ The American Heritage Dictionary defines "biogeography" as "the biological study of the geographic distribution of plants and animals." American Heritage Dictionary, 2d College Edition 180 (1982).

²² Other applications for which rules were not proposed that year had as their "specified geographic areas" waters off Seabrook, New Hampshire (rules anticipated for 1998) and the U.S. North Atlantic Ocean (application rejected). See NMFS, Marine Mammal Protection Act of 1972 Annual Report, January I, 1997 to December 31, 1997 at 61-63 (Oct. 13, 1998).

uncertain in its consequences.²³ The Navy's unprecedented request that is now before the agency renders the MMPA's "geographic area" language absolutely meaningless.

In its attempt to surmount this bar, NMFS has divided up the Navy's vast operations range into 16 areas, each one enormous in size. For example, the area defined in the Proposed Rule as "D" would cover the Western North Pacific ocean from 20° N. latitude (about 200 miles north of the Philippines) to the Aleutian Islands and Sea of Okhotsk (at Kamchatka), all the way east to 175° W. longitude (near Midway Island). Similarly, area "E" would cover the Eastern North Pacific, from 42° N. latitude (the: California-Oregon border) to the Aleutian Islands (south of Alaska), all the way west to 175° W. longitude (near Midway). 66 Fed. Reg. 15390 (§ 2 16.180(a)(3)). Yet the legislative history that NMFS quotes for the meaning of "geographic area" specifically rules out this sweeping approach. It was Congress' intent that "the specified geographical region should not be larger than is necessary to accomplish the specified activity, and should be drawn in such a way that the effects on marine mammals in the region are substantially the same. Thus, for example, it would be inappropriate to identify the entire Pacific coast of the North American Continent as a specified geographical region, but it may be appropriate to identify particular segments of that coast having similar characteristics, both biological and otherwise, as specified geographical regions." H. Rpt No. 228, 97th Cong., 1st Sess. 19 (1981).²⁴

By Congress' definition, conditions and effects within the broad geographic regions set forth in NMFS' Proposed Rule cannot be considered "substantially the same." What Congress clearly intended was a permitting process that worked at a more precise and smaller scale. In this regard, one might note that species abundance and biological productivity varies substantially within each geographic region that NMFS has proposed. It is well known, for example, that canyons, seamounts, and other structures tend to attract high concentrations of marine mammals, as the Gully of Nova Scotia attracts bottlenose whales and the Azores sperm whales.²⁵ It also appears that steep submarine slopes, such as one finds on mounts and canyons and where the continental shelf breaks into deep ocean, provide habitat for the prey species of many deep-diving whales; and that inclined

²³ See, e.g., the following "Marine Mammal Protection Act of 1972 Annual Reports" for activities that NMFS reviewed pursuant to the MMPA: January 1, 1997 to December 31, 1997 at 61-63 (Oct. 31, 1998); January 1, 1996 to December 31, 1996 at 38-39 (Oct. 29, 1997); January 1, 1995 to December 31, 1995 at Ch. 5 (1996); and January 1, 1994 to December 31, 1994 at 20-21 (1995).

²⁴ It might be noted that the broad global divisions used by NMFS in this case date back, with some modifications, to 1971 (see 66 Fed. Reg. 15378) and would have been available to Congress for about one decade when the "small take" provision was enacted in 1981.

²⁵ Personal communication from Dr. John Goold, Institute of Environmental Science, University of Wales at Bangor (May 2001). Similar points appear in written comments submitted on the Navy's draft EIS. See passim FEIS, vol. 2.

topography creates conditions for the upwelling of nutrients, which may support a food chain near the water surface that includes marine mammals.²⁶ In drawing up regions with so wide a brush, in equating waters off Hawaii with waters off the Aleutian Islands, the Proposed Rule is plainly inconsistent with the more careful, more focused process that Congress intended.

(2) The abundance of marine mammals within identified species and stocks that may be "taken" by LFA exceeds any reasonable interpretation of the statute's "small numbers" provision.

In its Proposed Rule, NMFS asserts that the statutory provision to allow only "small numbers" of takings is essentially the same as the provision to allow only takings that result in "negligible impact." 66 Fed. Reg. 15378.

To support its position, NMFS quotes the legislative history of Public Law 97-58, the 1981 amendments to the Marine Mammal Protection Act that established the provision on "small take" permits, for Congress' intent behind the "small numbers" provision. As NMFS reports, "The Legislative history for this provision stated that the Committee [on Merchant Marine and Fisheries, which drafted the provision,] recognized "the imprecision of the term... , but was unable to offer a more precise formulation because the concept is not capable of being expressed in absolute numerical limits."" 66 Fed. Reg. 15378. On this basis, NMFS concludes that its conflation of "small numbers" with the "negligible impact" standard is consistent with congressional intent. But it would have been more helpful, for the purpose of ascertaining what Congress intended, had NMFS quoted the larger passage from which its one chosen sentence was taken:

The taking authorized under these new provisions is the taking of small numbers of marine mammals. The Committee recognizes the imprecision of the term "small numbers", but was unable to offer a more precise formulation because the concept is not capable of being expressed in absolute numerical limits. The Committee intends that these provisions be available for persons whose taking of marine mammals is infrequent, unavoidable, or accidental.

It should also be noted that these new provisions of the Act provide an additional and separate safeguard in that the Secretary must determine that the incidental takings of small numbers of marine mammals have a "negligible" impact upon the species from which such takings occur. This additional test is meant to serve as a

²⁶ Id. Only last year, NMFS' Northeast Region cited the likelihood of high seasonal productivity and marine mammal abundance in the Hudson Canyon, some 90 miles off New York, in requiring the Navy to conduct formal consultations for a different acoustic acoustics program. See Letter from Patricia A. Kurkul, Regional Administrator for NMFS' Northeast Region, to Cdr. S. M. Tilden, Office of Naval Research (May 19, 2000).

separate standard restricting the authority of the Secretary. The term “negligible” is intended to mean an impact which is able to be disregarded. In this regard, the Committee notes that Webster’s Dictionary defines the term “negligible” to mean “so small or unimportant or of so little consequence as to warrant little or no attention.” Unless a particular activity takes only small numbers of marine mammals, and that taking has a negligible impact on the species, the new provisions of sections 101(a)(4) and (5) are not applicable to that activity.

H. Rpt No. 228, 97th Cong., 1st Sess. 19 (1981) (emphasis added).

It should be clear from this more extensive quote that the drafters intended “small numbers” and “negligible impact” to be separate and substantively distinct standards. By collapsing the statute’s “small numbers” provision into the separate “negligible impact” language that follows, however, NMFS has rendered the provision redundant, contrary not only to the legislative history but to basic rules of statutory interpretation.²⁷

NMFS has yet to determine whether LFA falls within the “small numbers” threshold. We believe, however, that the numbers of marine mammals implicated in even the Navy’s calculations of take far exceed any reasonable definition of the term “small.”

Even using the Navy’s figures, the numbers of marine mammals potentially affected by the system are extraordinary. For example, during each year of operation and with all of the mitigation and monitoring that the Navy has proposed, more than 16 percent of blue whales in the eastern north Atlantic, more than 10 percent of beaked whales in the Mediterranean Sea, more than 12 percent of elephant seals in the eastern North Pacific will be “affected.” Abundance data has not been provided, but the magnitude of the numbers involved in such percentages can be grasped by the fact that there are, by NMFS’ estimates, approximately 40,000 elephant seals in NMFS’ Pacific region, a small sliver of the total area designated here as the “eastern North Pacific.” Add this number to the elephant seal numbers projected for each of the other areas, add these to the aggregate numbers for every other marine mammal species, multiply by five (for the number of years of operation authorized by NMFS’ rule)-and one has the total number of marine mammals that the Navy believes are potentially affected

²⁷ Compare 50 C.F.R. §216.103 (defining “small numbers” and “negligible impact”) with 16 U.S.C. § 1371(a)(5)(A) and 16 U.S.C. § 1371(a)(5)(A)(i) (distinguishing “small numbers” from “negligible impact”).

by LFA deployment.²⁸ Since each animal may be taken a multiple of times, the number of takes would presumably be even higher.

The numbers become even more extraordinary when the Navy's analysis is exposed to scrutiny. In many significant ways, by failing to assess the potential for certain impacts, by providing faulty analyses of others, and by reinterpreting the MMPA against its plain meaning and intent, the Navy-and NMFS in proposing to adopt most of the Navy's analysis-have systematically underestimated the numbers of animals that may be taken should the LFA system be deployed. Many of the ways in which this has happened are discussed below; but in brief:

- (1) Neither the Navy nor NMFS has considered the potential for non-auditory physiological impacts;
- (2) Neither has meaningfully evaluated the potential for strandings;
- (3) Both have underestimated the potential for auditory impacts;
- (4) Both have failed to consider the full range of behavioral impacts and have underestimated the potential for those it has considered;
- (5) Neither has accounted for cumulative and synergistic impacts of multiple active systems or other sound sources operating in the same region; and
- (6) Both have underestimated or have failed to assess impacts on prey species.

The numbers would be higher still if certain apparent faults in the Navy's modeling problem were resolved. For (example, for some, if not all, of the modeled sites, such as those north of Kauai and in the southern Gulf of Alaska, uniform distributions were used, a method that fails to take the most densely populated areas into account; for all the sites, it remains unclear whether the most biologically significant areas, such as rookeries, breeding grounds, and migratory routes, were actually modeled.²⁹ Furthermore, it appears from the data provided in the Navy's FEIS that the Navy's researchers ran their modeling program an insufficient number of hours. Whereas LFA would transmit a proposed 72 hours during each tour of duty, the LFA model seems to have been run only 32 hours—the product of a 60-second “ping” repeated every 15 minutes for 20 days.³⁰ The difference between these two figures becomes more salient when tours of duty are multiplied, to reflect the proposed deployment. In sum, it would appear that, by this single error alone, the Navy has underestimated the overall impact of its system by a factor as great as 2.25, at least some of which would be reflected in

²⁸ A more complete analysis along these lines can be accomplished by compiling the best available distribution and abundance data from NMFS and other national and international agencies and running them through the Navy's percentages.

²⁹ See passim S.J. Labak, K.J. Vigness, K.S. Weixel, SURTASS LFA Sonar Technical Report H2: Acoustic Modeling (June 1999, rev. Jan. 2001).

³⁰ Compare FEIS at 2-8 with FEIS at 4.2-22, 4.2-38.

additional numbers of animals "taken." (Some part of this multiplier would also be reflected in higher equivalent received levels for animals exposed a multiple of times-a concern for NMFS in calculating negligible impact.)

The Navy has not provided sufficient information for NMFS to assess all of the takes that might occur. But from what has been provided, the Navy's numbers cannot by any reasonable interpretation be considered "small."

Congress, in recognizing the need to "act conservatively" where knowledge was in short supply, had good reason to limit the scope of activities eligible for a small take exemption. Regardless, there can be no doubt about what Congress intended. Based on the plain meaning of the statute and the clear intent of Congress as manifest in legislative history, it is clear that the "small take" provisions of the Marine Mammal Protection Act are inapplicable in the present case.

B. NMFS Has No Basis in the Navy's Application or in Its Own Analysis for a Finding of "Negligible Impact."

As noted above, the drafters of the MMPA's "small take" provision cited Webster's Dictionary to indicate what they intended by "negligible impact": that is, "so small or unimportant or of so little consequence as to warrant little or no attention." H. Rpt No. 228, 97th Cong., 1 st Sess. 19 (1981). The extraordinary number of takes expected to come of LFA deployment should at least give caution that the effects of deployment could exceed the bounds that Congress intended. In fact, it is not possible as a preliminary matter (66 Fed. Reg. 15379) for NMFS to make any determination about "negligible impact," because in several key respects the Navy has not furnished the agency with sufficient information. The Proposed Rule suggests, however, that NMFS is at the point of adopting most, if not all, of the Navy's analysis (66 Fed. Reg. 15375-15393). If it does so, it will have failed to analyze all of the system's foreseeable impacts on marine mammals--even some of the most severe; it will have underestimated the severity or extent of other impacts; and it will have reinterpreted the MMPA in ways that undercount species "take." Insofar as it relies on this analysis for a finding of "negligible impact," NMFS' decision will be arbitrary and capricious and in clear violation of the statute it is meant to enforce.

(1) Neither the Navy nor NMFS has assessed the potential for non-auditory physiological impacts on marine mammals and prey species.

It has been postulated by a number of researchers, following the mass mortality of cetaceans in the Bahamas last year, that the causal mechanism involved was acoustic resonance, the noise-induced vibration of air cavities (or other structures) within the bodies of animals.³¹ This vibration, if strong enough, can lead to

³¹ See, e.g., Letter from Kenneth Balcomb, Bahamas Marine Mammal Survey, to Joseph S. Johnson, SURTASS LFA EIS Program Manager (Feb. 23, 2001) (attached to the present document as Exhibit "E"); Letter from Dr. Mark McDonald to Donna Wieting (Apr. 2001); Letter from Dr. Hal Whitehead, Killam Professor of Biology, Dalhousie University, to Donna Wieting, Chief of Marine Mammal Conservation

hemorrhaging, possibly through shearing of erectile tissue, and then to serious injury or death. According to a researcher who participated in necropsies of the beached whales, the contribution of resonance to the Bahamas strandings appears consistent with both the necropsy results (bleeding from head cavities due to far-field acoustic or barotrauma) and with the established scientific literature (on resonance in general and resonance in beaked whales).³²

Resonance effects are a recognized problem. The Navy, for example, acknowledges that they are a potential hazard for humans and assesses them in a technical report on human diver studies that accompanies the FEIS. Yet the potential for these effects is not analyzed in the Navy's FEIS with regard to marine mammals or other species, despite the possible severity of their impacts.³³ That the LFA system operates at low frequencies, rather than at the mid-frequencies of the sonar implicated in the Bahamas strandings, does not excuse the Navy (assuming the Navy had offered this excuse): the best available scientific evidence indicates that LFA could match the resonance frequencies for cavities within a host of marine mammal species, depending on the volume and composition of the cavity and the barometric pressure on the animal, as several commenters have noted.³⁴ The Navy has not submitted information sufficient for NMFS to make a determination on the "negligible impact" of its activity, and for this reason alone NMFS' Proposed Rule should be withdrawn.³⁵

Division, National Marine Fisheries Service (May 28, 2001) (attached as Exhibit "F"); Letter from Dr. Stephen Dawson, Senior Lecturer, University of Otago, to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service (May 24, 2001) (attached as Exhibit "G"); Letter from John Potter to Donna Wieting (May 3 1,200 1). We expect other comment letters on this issue have been sent as well.

³² See Letter from Kenneth Balcomb to Joseph S. Johnson (Feb. 23, 2001). As of this date, NMFS has not released its necropsy data to the public.

³³ Compare FEIS at 10-96 and passim with FEIS, Technical Report 3: Summary Report on the Bioeffects of Low Frequency Water Borne Sound 4-5, 13-14 (Mar. 30, 1999).

³⁴ See, e.g., Letter from John Potter to Donna Wieting 5-9 (May 3 1,200 1), analyzing data presented in E.G. Barham, "Whales' respiratory volume as a possible resonant receiver for 20 Hz signals," 245 Nature 220 (1973); Letter from Kenneth Balcomb to Joseph S. Johnson (Feb. 23, 2001), analyzing formulae presented in SACLANT Undersea Research Centre, Summary Record, infra, at ann. H, in M. Minnaert, "On Musical Air Bubbles and the Sounds of Running Water," 16 Phil. Mag. 235-248 and in A. Andreeva, "Scattering of sound of bladders of fish in deep sound scattering ocean layers," 10 Soviet Phys. Acoust. 20-24 (1964). See also Letter from Mark McDonald to Donna Wieting (Apr. 200 1) (noting that "[t]he resonance frequency is a continuum over a broad range of frequencies in a given whale as the whale dives"). We are aware that several other commenters are using data published in the literature to generate tables of theoretical resonance frequencies and tissue displacement, for a range of volumes and depths within LFA's frequency band.

³⁵ It should also be noted that NMFS has not accounted for non-auditory physiological impacts, such as resonance effects, on prey species and the ecological consequences of these impacts for marine mammals, especially as the LFA system passes through areas of high biological productivity that particular populations or stocks rely on. For example, the severe and even lethal impacts that anthropogenic noise has been shown to induce in fish eggs and larvae has not been ruled out with respect to noise of the frequency

What information has been submitted strongly suggests that the consequences of resonance may not be "negligible." Indeed, as a number of researchers have observed in their comments, the potential for resonance effects transforms the environmental picture described in the Navy's LOA application and FEIS and NMFS' Proposed Rule on LFA, in terms of the nature and degree of the system's potential impacts, the types of species identified as species of concern, and the numbers of animals affected.³⁶ It is possible that serious injury would occur at intensities well below 180 dB and at distances well beyond the Navy's 1-kilometer "mitigation zone," perhaps within hundreds of kilometers from the source. It is possible that among the species especially vulnerable to resonance are some, such as beaked whales, that fall outside the Navy's narrow definition (in its FEIS) of "indicator species." It is possible that resonance from active sonar could have population-level impacts, as seems to have occurred in the Bahamas, given that, since the strandings occurred, the entire resident population of Cuvier's beaked whales has essentially disappeared.³⁷ The implications of this information, and the expression of concern from many in the scientific community, belies the agency's assertion of LFA's "negligible impact."³⁸

(2) NMFS has failed to properly consider the potential for strandings, and mortalities resulting from strandings, in its assessment of negligible impacts.

That active sonar has caused marine mammals to strand is uncontroversial. Last March, shortly after the release of its Proposed Rule on LFA, NMFS announced it was now considered "highly likely" that a Navy active sonar system operating in the mid-frequency range caused the mass mortality of whales in the Bahamas last March.³⁹ But there is additional evidence of strandings caused by sonar that

and intensity (and other characteristics) of the LFA signal. Compare FEIS at 1 O-65 with A.A. Myrberg, "The effects of man-made noise on the behavior of marine mammals," 16 *Env. Int.* 575.

³⁶ See, e.g., Letter from Kenneth Balcomb (Feb. 23, 2001); Letter from Dr. Mark McDonald to Donna Wieting (Apr. 2001); Letter from Dr. Hal Whitehead to Donna Wieting (May 28, 2001); Letter from Dr. Stephen Dawson to Donna Wieting (May 24, 2001); Letter from John Potter to Donna Wieting (May 31, 2001).

³⁷ Letter from Kenneth Balcomb (Feb. 23, 2001) (observations of Bahamas Marine Mammal Survey). See also Letter from Dr. Hal Whitehead (May 28, 2001). In this regard, it should be noted that resonance effects of even the greatest severity would not necessarily result in strandings; the body of an animal killed on the open ocean could sink, rather than strand.

³⁸ In addition, a number of other non-auditory physiological effects have not been evaluated by NMFS or by the Navy. These include, *inter alia*, resistance to immunity; vestibular effects (which are not related to hearing); effects on the vibro-tactile system; and stress. With regard to the last, it should be noted that stress induced by military noise has been demonstrated to have population-level effects on the reproduction rate of terrestrial mammals. See, e.g., Ronald P. Larkin, Larry L. Pater, David J. Tazik, Effects of Military Noise on Wildlife: A Literature Review (Jan. 1996) (U.S. Army Corps of Engineers Research Laboratories Tech. Rep. 96/2 I).

³⁹ NMFS, NOAA Fisheries Status Report on the One Year Anniversary of the Stranding of Beaked Whales in the Bahamas (Mar. 26, 2001).

neither the Navy nor NMFS has given any weight. A mass stranding of beaked whales off the coast of Greece, in 1996, was correlated by a researcher with tests of a NATO active sonar system that had low-frequency components; a subsequent NATO investigation found the strandings were closely timed with its ship movements and ruled out nearly every other possible cause, though it could not strictly prove causation given the lack of any necropsy data on the beached whales.⁴⁰ And the historical records of beaked whale strandings, compiled by the Smithsonian Institution's Marine Mammal Program in the wake of the Bahamas event, suggest a very high correlation between naval activities and both individual beaked whale strandings and multispecies strandings involving beaked whales.⁴¹

Of course, it is as yet unknown what frequencies and intensities are of concern for which species and it is not yet certain what mechanisms-resonance effects, vestibular effects, or some other pathology-were involved in each of these cases.⁴² Thus there is no evidentiary basis for the position, adopted by the Navy (FEIS at 3.2-45 to 3.2-47), that the difference in frequency makes LFA particularly safe or that beaked whales are the only species vulnerable to strandings.⁴³ NMFS, to its credit, does not suggest that intense low-frequency noise cannot cause marine mammals to strand and die. The sole rationale it offers, in concluding that LFA sonar "will not cause the direct removal of animals" through strandings, is that the system will be operated so far offshore as to effectively eliminate the potential for strandings. 66 Fed. Reg. 15380, 15386.

There is, however, no evidence to support this conclusion. Indeed, data from the Greece and Bahamas mass strandings-the only two relevant stranding incidents

⁴⁰ A. Frantzis, "Does acoustic testing strand whales?" 392 *Nature* 29 (1998) (correlation data published in peer-reviewed correspondence section of leading scientific journal); SACLANT Undersea Research Centre, Summary Record: SACLANTCEN Bioacoustics Panel, SACLANTCEN marine Mammal Environmental and Mitigation Procedures Panel, SACLANTCEN Human Diver and Marine Mammal Environmental Policy, and SACLANTCEN Human Diver and Marine Mammal Risk Mitigation Rules, La Spezia, Italy 1-1 to 2-6 1 (1998) (SACLANTCEN M- 133) (subsequent NATO investigation).

⁴¹ Marine Mammal Program of the National Museum of Natural History at the Smithsonian Institution, Historical Mass Mortalities of Ziphiids (Apr. 6, 2000), reported in Report of the Scientific Committee of the International Whaling Commission (raw data on beaked whale strandings and multispecies beaked whale strandings); Letter from Dr. Hal Whitehead to Donna Wieting (May 28, 2001) (statistical analysis). See also Letter from Dr. Sascha K. Hooker, British Antarctic Survey, and Dr. Robin W. Baird, Dalhousie University, to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service (May 21, 2001) (attached to the present document as Exhibit "H").

⁴² NMFS acknowledges the latter point with regard to the Bahamas strandings: "The specific aspect of the sonar signal [implicated in the strandings], and the mechanism by which it acts, has not been identified." NMFS, NOAA Fisheries Status Report (Mar. 26, 2001). As the specific causal mechanism is unknown, it follows that one cannot rule out the potential for strandings in the case of other active sonars, such as LFA, as the authors of the Navy's FEIS have done.

⁴³ The Navy files its summary treatment of the Bahamas strandings under the "beaked whale" section of the "Affected Environment" chapter, failing to assess the potential for strandings in Minke whales (which also stranded in the Bahamas) and in other species.

for which time-distance analyses are available-suggests that intense noise can cause strandings at received levels well below 180 decibels (the level prohibited within 12 nautical miles of the co&t) and from source positions beyond 12 nautical miles from the eventual beaching sites (the distance, less a kilometer, that the Navy has agreed to **maintain**).⁴⁴ If anything, the LFA system's **high** effective source level (which probably exceeds the source levels of the Greek and Bahamas sonars) and comparatively slow attenuation rate (owing mainly to the slower absorption rate of its signals) makes it a greater risk at distance than either of these other sources, other factors being equal.⁴⁵ Since there plainly is potential for strandings to occur from deployment of LFA, NMFS is obliged to include them in its present calculations.⁴⁶

(3) NMFS, in relying on the Navy's analysis, has significantly underestimated the potential for auditory impacts.

As NMFS correctly observes (66 Fed. Reg. 15386), the standard that governs the Navy's assessment of harm-whether from physiological, auditory, or behavioral impacts-derives from the Navy's analysis of threshold shift in marine mammals. The Navy claims to have taken the best available scientific evidence and, after due consideration, to have found it consistent with a standard of 180 dB, which, conveniently, is the stated detection range of the Navy's monitoring system. FEIS at 1-19 to 1-28. Yet it is unclear what that best available scientific evidence in this area consists of. The two justifications that NMFS offers in its Proposed Rule differ from each other and do not represent the Navy's apparently more sophisticated analysis in the FEIS.⁴⁷ These separate inconsistencies are confusing. Notwithstanding this, as appears below, each of these analyses tends to underestimate the potential for auditory impacts, insofar as it is relevant evidence at all.

⁴⁴ SACLANT Undersea Research Centre, Summary Record at 2-3 to 2-8, 2-34 to 2-37 (Greece); Letter from Kenneth Balcomb, Bahamas Marine Mammal Survey, to Joseph S. Johnson, SURTASS LFA EIS Program Manager (Feb. 23, 2001) (Greece (analysis) and Bahamas); Kenneth Balcomb and Diane Claridge, Report on the whale and dolphin strandings around March 15, 2000 on Abaco, Grand Bahama, and North Eleuthera, Bahama Islands (2000) (Bahamas). See also Letter from Dr. Hal Whitehead 2 (May 28, 2001) ("In neither of these stranding events is it reasonable that all, or even many, of the animals involved received levels of greater than 180dB, yet they died"). Ships transiting the Northwest Providence Channel may run well beyond 12 nautical miles from where the strandings occurred; the Navy must release its time-distance chart of ship movements relative to the strandings, if a clearer assessment is to be made.

⁴⁵ Compare SACLANT Undersea Research Center, Summary Record at 2-30 (TVDS source) and Office of Naval Research, Overseas Environmental Assessment (OEA) for the Littoral Warfare Advanced Development (LWAD) 00-1 Sea Test at 14 (Mar. 2000) (AN/SQS-53C source) with FEIS at 2-3, 4.2-3 I to 4.2-33, B-7 (SURTASS LFA source).

⁴⁶ It should go without saying that the Navy's decision not to apply for a "small take" permit covering incidental take by mortality does not exempt NMFS from properly addressing the real potential for mortality from strandings and other effects, in the manner required by law. Cf. Kokechik Fishermen's Ass'n v. Secretary of Commerce, 839 F.2d 795, 799-803 (D.C. Cir. 1988).

⁴⁷ Compare 66 Fed. Reg. 15386 with 66 Fed. Reg. 15380 and with FEIS at 1-19 to 1-28

In its treatment of risk, NMFS sets forth the evidence presented by the Navy in its draft EIS and small take application, a 1997 study conducted by Navy researchers in San Diego, along with a follow-on study conducted by the same laboratory. 66 Fed. Reg. 15386. These studies suggest, in brief, that the onset of temporary threshold shift in bottlenose dolphins exposed to a single, 1 -second pure tone occurs at levels just above 190 dB.⁴⁸ But NMFS' reliance on them here, as the basis for a general standard of auditory impacts, is unwarranted for several reasons. First, in order to compensate its setting in San Diego Bay, an area of high but variable ambient noise, the researchers used masking thresholds of some 20-40 dB above acoustic sensitivity-al technique that has long been known to audiologists to result in less observable: threshold shift and thus weaker damage risk criteria.⁴⁹ Second, in extrapolating from the two species of odontocete featured in the study, bottlenose dolphins and beluga whales, NMFS would unjustifiably cut a wide range of species from different orders and suborders into a single standard: There is no valid reason to believe that the two species tested here are the two most acoustically vulnerable species in the marine mammal field. And third, in extrapolating from the single, pure 1-second tones used in the study to repeated exposures of LFA's broadband 1 00-second "pings," NMFS is assuming an analogy between forms of sound that are not superficially analogous.⁵⁰

Elsewhere in its analysis, in responding to commenters who questioned the Navy's use of a 180 dB criterion for mitigation purposes, NMFS finds justification in a different piece of evidence. "Based on information provided at two public workshops," it asserts, referring to the HESS (High Energy Seismic Survey) Workshop of June 12- 13, 1997 and the NMFS Acoustic Criteria Workshop of September 1998, "in general, 180 dB is the level above which scientists caution a PTS [Permanent Threshold Shift] injury has the potential to

⁴⁸ See S.H. Ridgway, D.A. Carder, R.R. Smith, T. Kamolnick, C.E. Schlundt, and W.R. Elsberry, Behavioral responses and temporary shift in masked hearing threshold of bottlenose dolphins, Tursiops truncatus, to 1-second tones of 141 to 201 dB re 1 μ Pa (July 1997) (Tech. Report 175 I); C.E. Schlundt., J.J. Finneran, D.A. Carder, S.H. Ridgway, "Temporary shift in masked hearing thresholds of bottlenose dolphins, Tursiops truncatus, and white whales, Delphinapterus leucas, after exposure to intense tones," 107 Journal of the Acoustical Society of America 3496 (2000).

⁴⁹ This problem is acknowledged in the follow-on study and, accordingly, the authors are cautious in their claims: "The limited data from this study do not support additional conclusions. A more systematic effort with a larger sample size is likely needed to fully explore the effects of masking noise on TTS [temporary threshold shift] in cetaceans." Schlundt et al., "Temporary shift in masked hearing thresholds," at 3506.

⁵⁰ For example, the exposure-duration relationships that the Navy cites to analogize the sounds used in the San Diego research to those used in LFA have been shown (at least in the context of human audiology) to break down on multiple exposures. Letter from Dr. Ronald J. Schusterman, Dr. David Kastak, Brandon L. Southall, M.Sc., and Colleen Reichmuth Kastak, M.Sc., Long Marine Laboratory of the University of California at Santa Cruz, to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service 2 (May 2001) (attached to the present document as Exhibit "I"), citing W.D. Ward, "Effects of high-intensity sound," 3 Encyclopaedia of Acoustics 1497 (I 997).

occur in marine mammals.” 66 Fed. Reg. 15380. Unfortunately, with regard to both workshops, the assertion is inaccurate. The HESS Workshop of 1997 was devoted to discussion of a very different type of noise, the millisecond impulses of seismic surveys, which participants carefully distinguished from continuous or intermittent noise, like the kind at issue: here; the interim standard proposed then referred strictly to impulsive noise, and is not especially relevant **here**.⁵¹ The Acoustic Criteria Workshop of 1998, while concerned with a wider range of sounds, mentioned the 180 dB criterion only to affirm its applicability, as an interim standard, to the impulsive noise of seismic surveys, and not to noise “in general.”⁵² One of the problems with relying on such evidence, instead of on peer-reviewed, published research, is the potential for misstatement.

The rationale offered by the Navy in its FEIS is different still.⁵³ It draws primarily from research in human audiology, particularly from a 1997 article by the late audiologist W.D. Ward, which sets forth a basic formula for calculating “maximum safe exposure level”—the point above which permanent threshold shift may occur—in humans; and then applies this research to marine mammals. In brief, the Navy begins by determining a species’ acoustic sensitivity to sounds within the LFA system’s operating frequencies; adds the noise level to which these animals may be exposed continuously with no expected threshold shift, temporary or permanent (a level known as “Equivalent Quiet”); and, finally, adds a number to compensate for differences in the duration of exposure. FEIS at 1-23 to 1-28. Thus the model, and at least some of the numbers, used in human audiology are imported into the less understood field of marine mammal hearing.

To even make such a leap, especially with regard to so crucial a finding as the Navy’s standard of harm, runs strongly against the prevailing scientific view on interspecific variability.⁵⁴ But what is more, the Navy’s theory is inconsistent with the little empirical data that exists on auditory impacts in marine mammals.

⁵¹ Panel discussion at HESS (High Energy Seismic Survey) Team Workshop, Pepperdine University, . Malibu, Calif. (June 12-13, 1997). The distinction made between impulsive noise and continuous or intermittent noise, with regard to auditory damage in animals, is generally accepted by the scientific community. See, e.g., W. John Richardson, Charles R. Greene, Jr., Charles I. Malme, and Denis H. Thomson, Marine Mammals and Noise 366-76 (1995).

⁵² Panel discussion at NMFS’ Acoustic Criteria Workshop, National Oceanic and Atmospheric Administration Headquarters, Silver Spring, Md. (Sept. 10-11, 1998). If NMFS intends to rely on these workshop proceedings for future rulemakings, we request that it create a transcript for release to the public.

⁵³ NMFS does not rely, or even acknowledge, this rationale in the analysis accompanying its Proposed Rule. See 66 Fed. Reg. 15380, 15386. Given NMFS’ use of the future tense in reference to the FEIS, and given that it cites only the draft EIS throughout its analysis, it seems likely that its analysis was written before the FEIS was released and was not updated to reflect the Navy’s novel theory.

⁵⁴ On interspecific variability, see, e.g., D.R. Ketten, “Estimates of blast injury and acoustic trauma zones for marine mammals from underwater explosions,” in R.A. Kastelein, J.A. Thomas, and P.E. Nachtigall, eds., Sensory Systems of Aquatic Mammals 39 I (1995); National Research Council, Marine Mammals and Low-Frequency Sound: Progress Since 1994 5 I (2000); Letter from Ronald J. Schusterman et al. to Donna Wieting 2 (May 2001).

As the authors of one of the two extant studies on the subject observe, the Navy's calculations depend upon, *inter alia*: (1) an assumption of Equivalent Quiet (70 dB), borrowed from human data, that does not comport with the level of TTS that has been demonstrated to occur in some species of pinnipeds, exposed to nearly continuous sound for 20-22 minutes (55 dB – 60 dB); and (2), with respect to pinnipeds, faulty audiometric data that appears to underestimate the acoustic sensitivity of *phocids*.⁵⁵ If NMFS, following the Navy, is to apply this human model in a manner consistent with the existing empirical data, it must at the very least reduce its "maximum safe exposure level" by 10- 15 dB or more to compensate for the lower level of "Equivalent Quiet" demonstrated in marine mammals; and it must recalibrate its baseline audiometric data on pinnipeds and adjust its criteria for these species accordingly.

(4) NMFS has significantly underestimated the severity of auditory impacts by misinterpreting the law.

At the same time that it relies on incorrect or inconsistent information to establish criteria concerning permanent hearing loss in marine mammals, NMFS misinterprets the law, as well as the existing science, to downgrade the severity of temporary hearing loss. From 1998, when it issued regulations on the Navy's ship-shock trial of the USS Seawolf, until this year, NMFS considered temporary threshold shift (TTS) to fall within the definitions of both "Level A" and "Level B" harassment under the Marine Mammal Protection Act: "Level A"--because of the physiological injury involved in hearing loss, and "Level B"--because of disruptions in behavior that occur in hearing-impaired animals. See 16 U.S.C. § 1362(18). With this Proposed Rule, along with a Final Rule on a new Navy ship-shock trial that was reviewed concurrently, the agency would downgrade TTS to the "Level B" category on the grounds that it is not really injurious. 66 Fed. Reg. 15386; 66 Fed. Reg. 22457. The effect of this action is to remove TTS from consideration in NMFS' establishment of a "standard of harm" for LFA. 66 Fed. Reg. 15386.

NMFS does not provide the scientific basis for its action, though it claims there is "general agreement" among "NMFS scientists and other scientists" for it. It distinguishes temporary threshold shift from injury only by noting that TTS "does not result in hearing damage." 66 Fed. Reg. 15386. There is, in fact, some controversy in the audiological literature over the pathology of TTS. According to some studies a temporary shift in hearing thresholds may not correlate with any permanent damage to the cochlear substrate of the inner ear-at least at relatively low levels of hearing loss. But other physiological impacts on the ear have been

⁵⁵ Letter from Ronald J. Schusterman et al. to Donna Wieting (May 2001). The Navy had attempted to ground its "maximum safe exposure" theory in the data from this lab's 1999 study. See D. Kastak, R.J. Schusterman, B.L. Southall, and C.J. Reichmuth, "Underwater temporary threshold shift induced by octave-band noise in three species of pinniped," 106 Journal of the Acoustical Society of America I 142 (1999).

demonstrated: a swelling and vacuolization or shortening of the stereocilia rootlets; a depletion of synaptic bodies and associated vesicles; a buckling of cochlear pillar bodies and an uncoupling of stereocilia from the tectorial membrane.⁵⁶ There is no controversy in the literature over whether TTS is a physiological effect, and it is therefore an "injury" within the plain meaning of the statute.⁵⁷

Moreover, although NMFS intends to reshape the law around such a distinction, the relation between temporary threshold shift and permanent threshold shift is not well understood in the scientific literature. By way of illustration: NMFS asserts in its analysis that "a range of only 15-20 dB may exist between the onset of TTS and the onset of PTS" in some unspecified species (66 Fed. Reg. 15386); yet the Navy has observed that at least in humans 10 dB, not 15-20 dB, is the key interval (FEIS at 1-24), and it was repeatedly suggested at the Acoustic Criteria Workshop referenced by NMFS elsewhere that the failure of physiologists to detect an even closer relation may be due to deficiencies in observational technology rather than to the nature of the impact itself. The situation is further complicated in the present case by the fact that some animals within LFA's range of operations will receive multiple exposures without having time to recover, making the auditory impacts even harder to predict.⁵⁸

The information provided by the Navy and NMFS does not begin to justify, if it ever could, the agency's misinterpretation of law.

(5) NMFS has underestimated the potential for behavioral impacts by misinterpreting and extrapolating unjustifiably from the Navy's Scientific Research Program.

NMFS' assessment of the potential behavioral impacts of LFA, which follows the Navy's, is severely compromised by an overreliance on the Navy's Scientific

⁵⁶ See, e.g., A.S. Nordmann, B.A. Bohne, and G.W. Harding, "Histopathological differences between temporary and permanent threshold shift," 139 Hearing Research 13 (2000).

⁵⁷ It should also be noted that hearing loss, whether temporary or permanent, can induce severe injury indirectly. For possible evidence of fatal injury in marine mammals associated with hearing loss caused by anthropogenic noise, see M. André, C. Kamminga, and D. Ketten, "Are Low-Frequency Sounds a Marine Hearing Hazard: A Case Study in the Canary Islands," 19 Proceedings of the Institute of Acoustics 82 (1997). See also Sean Todd, Peter Stevick, Jon Lien, Fernanda Marques, Darlene Ketten, "Behavioral Effects of Exposure to Underwater Explosions in Humpback Whales (*Megaptera novaeangliae*)," 74 Canadian Journal of Zoology 166 1-72 (1996).

⁵⁸ See 66 Fed. Reg. 22458 (NMFS, stating that "[w]hile there is some recent research indicating that there is no relationship between repeated TTS exposures and an animal incurring a PTS injury, the science indicates that PTS can occur with repeated exposures of TTS without allowing animals to completely recover"). See also Letter from Dr. Ronald Schusterman et al. to Donna Wieting (May 2001) (noting how, according to the audiological literature used by the Navy to support its 180 dB criterion, the assumptions used by the Navy concerning the relation between exposure duration and intensity with regard to TTS begin to "break down for multiple exposures").

Research Program ("SRP"). It was noted by numerous commenters on the Navy's Draft EIS-and, contrary to the Navy's suggestions in the FEIS (at 1-28), by representatives of the scientific and environmental communities at the Navy's preliminary workshops-that the SRP was extremely limited in the species it covered (four species of baleen whales), the exposures it examined (received levels below 155 dB, mostly below 145 dB), the temporal and spatial parameters it observed, and the impacts it looked for (changes in vocalization, dive patterns, position, and migration), and that therefore it could not be used, regardless of the findings, to show absence of harm.⁵⁹ In addition, at least some of the researchers were compromised by insufficient statistical power, as one of the biologists involved in the SRP himself observed.⁶⁰

But the Navy and NMFS have extrapolated beyond any reasonable standard of scientific inquiry, using the SRP to effectively trump the field: to rule out consideration of the entire growing body of literature pertaining to the behavioral impacts of intense anthropogenic noise on marine mammals, even for species and effects that the Navy had not studied.⁶¹ This reaches a point of reductio ad absurdum in the Navy's treatment of the Bahamas strandings (FEIS at 3.2-47), where it suggests that the lack of observed strandings during the SRP rules out any conclusions that might be made about potential impacts on the basis of that incident (and subsequent investigation).⁶² Insofar as NMFS, like the Navy, relies almost exclusively on the SRP for its assessment of LFA's potential impacts, its decision will be arbitrary and capricious.

⁵⁹ One of the authors of the present comments (Joel Reynolds) attended the SRP workshop held in Boston, in 1997. See also Personal Communication from Dr. Naomi Rose, Marine Mammal Scientist, Humane Society of the United States (May 2001) (also in attendance); and passim FEIS, vol. 2. For a list of some of the many direct and indirect behavioral and other impacts that would have gone undetected in the Navy's study, see Letter of Dr. Lindy Weilgart, Dalhousie University to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service 5 (May 7, 2001) (attached to the present document as Exhibit "K").

⁶⁰ "Some of the research projects conducted, especially the phase on blue and fin whales that I was involved with, were not able to fully achieve their objectives... It is important that the limited sample size from this experiment not be construed as indicating a lack of impact." Letter from John Calambokidis, Research Biologist, Cascadia Research Collective, to Joseph S. Johnson, SURTASS LFA Sonar OEIS/EIS Program Manager (Oct. 27, 1999), reprinted in FEIS, vol. 2, at E-348.

⁶¹ See, e.g., Mary Lou Jones, Steven L. Swartz, and Marilyn E. Dahlheim, Census of Gray Whale Abundance in San Ignacio Lagoon: A Follow-Up Study in Response to Low Whale Counts Recorded During an Acoustical Playback Study of Noise-Effects on Gray Whales (1994) (Marine Mammal Commission No. MM29 11023-o); Richardson et al., Marine Mammals and Noise (1995); W.J. Richardson and B. Würsig, "Influences of man-made noise and other human actions on cetacean behavior," 29 Marine and Freshwater Behavior Physiology 188 (1997); D. Croll, B. Tershy, A. Acevado, and P. Levin, Marine Vertebrates and Low-Frequency Sound: Technical Report for LFA EIS (Feb. 28, 1999) (commissioned by the Navy for its EIS, but not used in establishing standards for behavioral or other impacts).

⁶² It is worthwhile comparing the statistical integrity of the Navy's method here against the statistical integrity of the studies it dismisses in the same section of the FEIS and of the analysis that has recently been performed on the historical record of beaked whale strandings. See Letter from Dr. Hal Whitehead to Donna Wieting 2-3, 4 (May 28, 2001).

(6) NMFS has underestimated the potential for behavioral impacts by misinterpreting the statutory definition of harassment.

NMFS and the Navy underestimate the potential for behavioral impacts by narrowing the definition of what a behavioral impact is. The MMPA defines Level B harassment as any act "[that] has the potential to disturb a marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." 16 U.S.C. §1362(18)(2). NMFS, by contrast, would adopt the Navy's position and define "Level B" harassment-and therefore the lower limit of harassment under the MMPA-as an act that causes "significant disturbance of a biologically important behavior." 66 Fed. Reg. 15385, 15386-87. This interpretation, in narrowing Congress' harassment definition from "disruption" to an unclearly defined "significant disturbance" and from "behavioral patterns" in general ("including, but not limited to..") to an unspecified group of behaviors that the Navy, and NMFS, considers "biologically important," runs against the plain meaning (and legislative history) of the statute. The agency's calculation of species "take" is based on a fundamental misinterpretation of law.⁶³

(7) NMFS has not assessed the potential for cumulative and synergistic impacts caused by multiple active sonar systems operating in the same region.

There is substantial evidence of the deployment or proposed deployment of other active sonar systems by domestic and foreign navies. This would include low-frequency active sonar systems that are currently in development by Germany, the United Kingdom, France, and Canada (at least).⁶⁴ Whatever environmental consequences these other systems may have apart from LFA, there remains the possibility-suggested by the Navy in its own preliminary statement on the Bahamas strandings-that LFA together with other systems operating in the same

⁶³ It should be noted that the redefinition of "harassment" that NMFS proposes now to make by rule is similar, if not identical to, what had been unsuccessfully proposed as new legislation by NMFS (together with the Navy and other affected agencies) only last year. Compare A Bill to amend the Marine Mammal Protection Act of 1972, as amended, to authorize the Act for period of five [5] years, and for other purposes § 513 (c. Sept. 2000) with 16 U.S.C. §1362(18).

⁶⁴ Letter from Walter Kolbow, Office of the Bundesminister der Verteidigung, to the President of the Deutschen Bundestages (Nov. 2, 2000) (Germany); "Decision Looms on Sonar 2087," 34 Jane's Defence Weekly 2 1 (Nov. 22, 2000) (United Kingdom and France); ASCOBANS Secretariat, Report of the 8th Meeting of the Advisory Committee to ASCOBANS 12-13 (Apr. 2-5, 2001) (Germany and the United Kingdom); "Canadian Navy Takes Part in Project to Save Whales from Submarine Sonar," Canadian Press, Sept. 3, 2000, available in LEXIS, Nexis Library, AP File (Canada). Many active sonar systems in deployment or development by the U.S. Navy are identified in the environmental documents prepared for the Navy's Littoral Warfare Advanced Development program. See, e.g., Office of Naval Research, Overseas Environmental Assessment for 00-1 Sea Test (which tested, inter alia, the sonar system implicated in the Bahamas strandings).

region can produce cumulative or synergistic effects.⁶⁵ This possibility is not meaningfully addressed by the Navy in its FEIS, nor by NMFS in its Proposed Rule, resulting again in an underestimation of take.

(8) NMFS has not properly assessed impacts on endangered, threatened, and depleted species and stocks.

The agency has not properly assessed the potential impacts of LFA on endangered and threatened species, especially in light of new information about resonance effects, strandings, and other impacts with the potential for broad and severe effects. The problem is exacerbated due to insufficient, incomplete, or misleading statements made in the Navy's FEIS. For example, the Navy fails to note that a substantial portion of the female population of Northern right whale—which according to NMFS' most recent stock reports is diminished to about 200 individuals and is commonly believed to be the most endangered species of great whale in the world—migrates well offshore of the continental United States and Canada and well outside of the Navy's Offshore Biological Exclusion Area, where presumably the risk of impact would increase.⁶⁶ And, for example, the Navy wrongly excludes the endangered dugong from its list of species of concern, failing to report that the dugong occurs more than 12 nautical miles off the Australian coast.⁶⁷ Relatively little is known about concentrations of other endangered and threatened species, such as blue and fin whales, especially in the open sea. Given these problems, and the substantial potential for serious impacts that we have discussed, NMFS cannot make an affirmative finding that LFA would have a "negligible impact" on endangered and threatened species and stocks.

C. NMFS Has Not Satisfied Its Duty to Prescribe "Methods" and "Means" of "Effecting the Least Practicable Adverse Impact" and "Requirements Pertaining to the Monitoring and Reporting of [Takes]."

Because the Navy's application does not meet the statutory criteria of a small take exemption and fails legally or factually to support an affirmative finding of "negligible impact," the rule that NMFS has proposed should be withdrawn. But even if the

⁶⁵ Cf. Letter from Mr. Robert B. Pirie, Jr., Assistant Secretary of the Navy for Installations and Environment, to Ms. Penelope D. Dalton, NOAA Assistant Administrator for Fisheries (June 9, 2000). Note that, in gauging the significance of new information, the Navy is also obliged to consider "whether [its proposed] action is related to other actions with individually insignificant but cumulatively significant impacts." 40 C.F.R. § 1508.27(b)(7).

⁶⁶ Personal communication with Dr. Naomi Rose, Marine Mammal Scientist, Humane Society of the United States (May 2001).

⁶⁷ Compare FEIS at 3.2-2 with Letter of Dr. Paul K. Anderson, Emeritus Prof. of Zoology, University of Calgary, to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service 2 (May 30, 2001) (attached to the present document as Exhibit "J"), citing Marsh et al., 16 Aust. Wildl. Res. 429-440 (1989).

exemption were available in the present case and NMFS could make a finding of “negligible finding,” the terms of operation prescribed by NMFS in its Proposed Rule fall far short of what the law requires. NMFS is enjoined by the Marine Mammal Protection Act to prescribe “methods” and “means” of “effecting the least practicable adverse impact” and to prescribe additional “requirements pertaining to the monitoring and reporting” of species take for any “small take” exemption it approves. 16 U.S.C. § 1371(a)(5)(A)(G). In neither instance has the agency met its statutory responsibility.

(1) NMFS has not set “requirements pertaining to the monitoring and reporting” of the vast majority of anticipated takes.

As set forth above, NMFS must prescribe “requirements pertaining to the monitoring and reporting of such takings [as it permits under the statute’s ‘small take’ provision] .” The requirements prescribed in the present case are devoted mainly to observation within a close range from the source. It is NMFS’ proposal that the Navy monitor and report environmental impacts within roughly 1 kilometer of its source ship; the source would be shut down should marine mammals be spotted within this distance. 66 Fed. Reg. 15392 (§ 216.185). There are a number of problems with this arrangement, however.

First, within the 1 kilometer distance, the methods that the Navy will be using are limited in their efficacy. The Navy proposes to spot animals visually from the deck of the ship (FEIS at 5-4), but the spotting rate through the use of this method is notoriously low, even for large cetaceans in clear conditions and in calm seas; the problem here is exacerbated by the Proposed Rule protocol, which would allow transmissions at night, in fog, and at Beaufort sea states greater than 3, which would further reduce the spotting rate.⁶⁸ The Navy also proposes to use passive acoustics to monitor for animals (FEIS at 5-4 to 5-5), but this method works only for species that are able to vocalize in the frequency range of the Navy’s passive sonar and are actually vocalizing at the time; it is another notoriously ineffective method of surveillance.⁶⁹ Finally, the Navy proposes to use a new active sonar system known as HF/M3 to monitor for animals. FEIS at 5-5. But, according to the Navy, it stands to be less effective at detecting smaller cetaceans and sea turtles than at finding the larger animals. FEIS at 2-18 to 2-19. According to NMFS, it had not been sufficiently field-tested as of the release of the Proposed Rule to warrant any reliance. 66 Fed. Reg. 15380, 15382, 15388. And, according to independent researchers, it is likely to fail at detecting deep-diving species such as sperm whales and beaked whales—two of the species thought most vulnerable to impacts from intense noise—before they surface into

⁶⁸ ~~Present~~ation of Dr. Peter Tyack, Woods Hole Oceanographic Institution, at meeting between stakeholders and the Navy on LFA, Boston, Mass. (Jan. 1997), quoted in Letter from Joel Reynolds, Senior Attorney, NRDC, to Mr. Stephen Honigman, General Counsel, U.S. Navy (Aug. 8, 1997) (attached to the present document as Exhibit “L”).

⁶⁹ Id.

what **may** be the hottest parts of the Navy's mitigation zone.⁷⁰

Second, **and** even more significantly, there would be no monitoring of impacts beyond 1 kilometer, even though the impact zone could extend hundreds of miles from the LFA source. In practice, this means that the vast majority of what the Navy calls "significant" takes, which range from "significant" disturbance of a "biologically important activity" to physical injury short of death--well over 9.5 percent of such takes, according to the Navy's analysis (FEIS at 1-30 to 1-31)--will occur well outside the observation zone and go unmonitored and unreported. No "requirements" are provided in the Proposed Rule for this vast majority of marine mammal takes. If impacts exceed the Navy's estimates, whether due to resonance effects or other mechanisms that have not been sufficiently investigated, that, too, may never be known.⁷¹

The lack of any effective monitoring and reporting to cover nearly all of the system's anticipated impacts not only violates the plain language of Congress' monitoring provision (16 U.S.C. § 1371(a)(5)(A)(ii)(II)), but renders the purpose of this provision nugatory. Since NMFS is directed to withdraw or suspend its "small take" permit should the impact of the permitted activity prove more than negligible, it follows that whatever monitoring and reporting scheme is adopted be sufficient to verify that impacts are, in fact, negligible. See H. Rpt No. 228, 97th Cong., 1st Sess. 18-20 (1981). Yet, as the Marine Mammal Commission observed in its comments on the Navy's draft EIS, the monitoring system for LFA that the Navy and now NMFS propose to adopt is not designed to validate the unproven assumptions (including those discussed above) on which any claim about negligible impact must rest.⁷² It is not designed to verify, given all the uncertainty and speculation in the FEIS and Proposed Rule, that LFA will "not have nonnegligible effects on the distribution, size, or productivity of the affected marine mammal species or population stocks."⁷³ The requirements set by NMFS are, therefore, fatally deficient.

⁷⁰ See, e.g., Letter from Dr. Sascha Hooker and Dr. Robin Baird to Donna Wieting 3 (May 21, 2001); and see passim FEIS, vol. 2. Cf. FEIS at 2-22 (accepting the possibility of this outcome).

⁷¹ The problems inherent in the Navy's monitoring program is indicated by the Bahamas event, where it is reasonable to believe that a substantial number of Cuvier's beaked whales was severely affected, and possibly killed, by intense active sonar outside what would have been the LFA mitigation range.

⁷² Letter from John R. Twiss, Jr., Executive Director, Marine Mammal Commission, to Joseph S. Johnson, SURTASS LFA Sonar EIS Program Manager 2, 20 (Oct. 27, 1999), reprinted in FEIS, vol. 2, at E-40, E-49.

⁷³ Id. at 2. In a 1991 report of the Commission, NMFS' monitoring and reporting duties were articulated in this way: requirements set by NMFS had to be designed "(1) to verify that the level, the manner, and the effects of the take are inconsequential [i.e., "negligible"], and (2) to detect any unforeseen level, manner, or effects of take." Steven L. Swartz and Robert J. Hofman, Marine Mammal and Habitat Monitoring: Requirements, Principles, Needs, and Approaches 2 (Aug. 1991) (report of Marine Mammal Commission). The Commission's report also makes note of some monitoring methods--which NMFS has not required here--that might be useful in monitoring distant effects of intense undersea noise.

(2) NMFS has not met its duty to consider and prescribe all "methods" and "means" of "effecting the least practicable adverse impact" on marine mammals.

To issue a "small take" permit, NMFS must impose mitigation requirements on the applicant, and fulfilling this statutory responsibility is no trivial matter. Its aim, in the words of a U.S. District Court, is to "reduce as much as practicable the taking of marine mammals"-which means that NMFS must consider every available method of mitigation and either prescribe it or be able to show why it is not practicable.⁷⁴ Unfortunately, the mitigation proposed by the Navy represents only the beginnings of this analysis: it is nothing more than a Hobson's choice between a preferred but unjustified mitigation scheme and no mitigation at all. See FEIS at 2-8 to 2-23. To fulfill its statutory duty, NMFS must do what the Navy has not. It must compare a full range of alternative methods and means to those the Navy prefers and prescribe as many as are necessary to "reduce as much as practicable" LFA's adverse impact.

In our comments on the Advance Notice of Proposed Rulemaking, we listed a number of mitigation methods that NMFS was required to consider. Few, if any, were adopted in the Proposed Rule.⁷⁵ Such methods and means include, but are not limited to:

- (1) For all missions, geographical restrictions above and beyond those proposed by the Navy, including an extension of the coastal exclusion zone beyond the limits of the territorial sea and the addition of biologically significant offshore areas, excluding canyons, seamounts, rookeries, mating grounds, waters within the boundary of U.S. National Marine Sanctuaries that extend beyond the 12-mile limit (as in the case of the Monterey Bay N.M.S.), and other identified or probable areas of significance, to be determined from stock assessments and other scientific evidence before operations begin;
- (2) Extension of geographic restrictions to completely cover the range of endangered Northern right whales;
- (3) Reduction in the maximum allowable received level below the current standard of 180 dB within the boundaries of all U.S. National Marine Sanctuaries;
- (4) For training and other missions for which a wider range of alternatives is available, assignment of operations to "desert" areas known to have low abundance of marine mammals and low biological productivity.

⁷⁴ Natural Resources Defense Council, 8.57 F. Supp. at 738. The court, in issuing the preliminary injunction, found that plaintiffs had "a near-certain likelihood of success on the merits" of their claim: viz., that NMFS had violated the MMPA by failing to prescribe an alternative site for the Navy's "ship-shock" trials or to show convincingly that an alternative was impracticable. Id. at 735.

⁷⁵ Compare Letter from Joel Reynolds, Senior Attorney, NRDC, and Michael Jasny, Project Associate, NRDC, to Donna Wieting, Chief of Marine Mammal Conservation Division, National Marine Fisheries Service 17-18 (Nov. 18, 1999) with 66 Fed. Reg. 15388.

- (5) Reductions in source level, duty cycle, and annual transmission hours;
- (6) Extension of the Navy's safety zone to the safest practicable distance, as by requiring pre-operation surveys of the local area of operations, which could be effective in avoiding some concentrations of animals;
- (7) Use of independent observers with appropriate security clearance;
- (8) Funding of independent research on resonance effects and other impacts that the Navy and NMFS have not considered before operations begin;
- (9) Replacement of LFA in whole or in part and to the extent practicable with new, advanced passive sonar technologies, which would reduce marine mammal takings incidental to deployment of LFA (cf. 66 Fed. Reg. 15382); or requirement that the Navy conduct a transparent and thorough alternatives analysis of such technologies before and each year the system is deployed;⁷⁶ and
- (10) Establishment of an extramural, independent board of scientists, regulators, representatives of environmental NGOs, and citizen representatives to review monitoring data and relevant research and to make recommendations (to NMFS as well as to the Navy) for reducing the system's impacts.

All of these methods must be prescribed or found through careful analysis to be impracticable. |

III. CONCLUSION

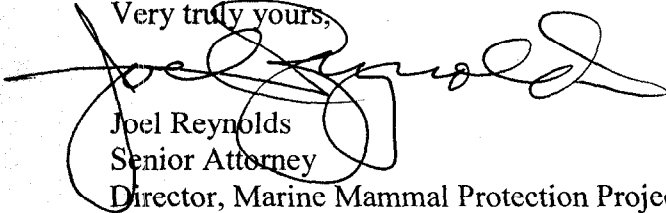
The Proposed Rule at issue here is extraordinarily important on its own terms, for the impacts it would authorize. But it will have enormous precedential effect as well. If finalized, it will alter the "small take" exemption: what numbers of animals may be taken, what range of operations may be considered, how takes are monitored, and what the very notion of "take" means.

⁷⁶ It is a core requirement of the National Environmental Policy Act that the Navy compare the environmental impacts of LFA to those of all reasonable alternatives. 40 C.F.R. § 1502.14. Yet the Navy has not considered the use of new and advanced passive sonar-such as Advanced Deployable Systems being tested off the California coast, towed arrays equipped with Acoustic Rapid Commercial-off-the-shelf Insertion (ARCI) processing, Robust Passive Sonar (RPS), and other systems-which have the potential to achieve the strategic goal of locating "quiet" submarines without the environmental costs of LFA sonar. Navy officials have recently appeared before Congress to tout the progress of some of these systems, affirming their ability to detect advanced diesel submarines at ranges previously thought to be "unobtainable." See RADM Malcolm I. Fages and RADM J.P. Davis, Statement before the House Armed Services Committee Military Procurement Subcommittee (June 27, 2000); RADM John B. Padgett, Statement before the House Armed Service Committee Military Procurement Subcommittee.(June 27, 2000). See also National Research Council, Technology for the United States Navy and Marine Corps, 2000-2035: Becoming a 21st Century Force, ch. 7-1 (1997) (stating the potential for significant boosts in detection range through the use of new passive technologies). However, in its own analysis of LFA, the Navy dismisses passive alternatives with an allusion to internal evaluations conducted at least a dozen years ago during the Cold War. FEIS at 1-8.

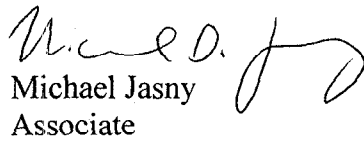
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For all these reasons, we urge NMFS to withdraw its Proposed Rule and deny the Navy's application.

Very truly yours,



Joel Reynolds
Senior Attorney
Director, Marine Mammal Protection Project



Michael Jasny
Associate